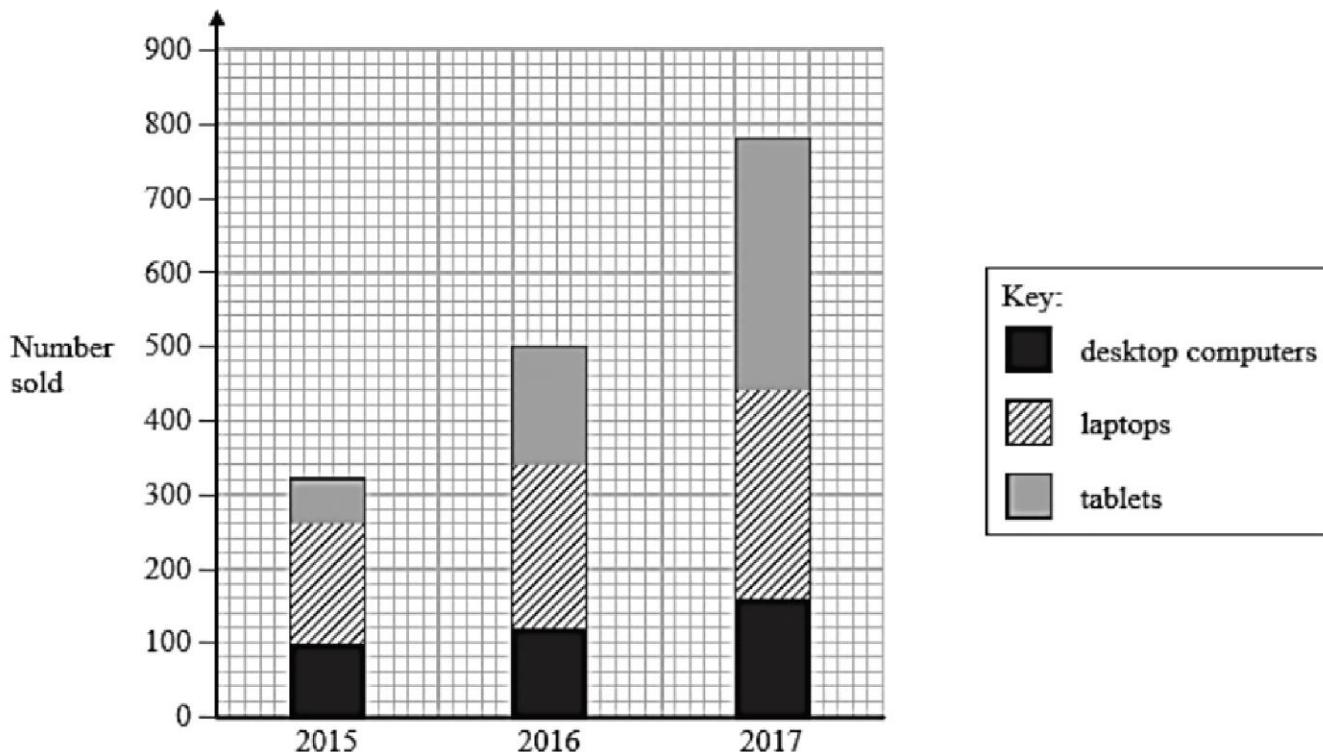


GCSE (9-1) Maths for Science Questions (F1)

12 A shop sells desktop computers, laptops and tablets.

The composite bar chart shows information about sales over the last three years.



(a) Write down the number of desktop computers sold in 2015

(1)

(b) Work out the total number of laptops sold in the 3 years.

(3)

(c) State the item that had the greatest increase in sales over the 3 years.
Give a reason for your answer.

16 $P = 4x + 3y$

$$x = 5$$

$$y = -2$$

(a) Work out the value of P .

17 There are some chocolates in a box.

$\frac{1}{4}$ of the chocolates contain nuts.

The rest of the chocolates do not contain nuts.

Write down the ratio of the number of chocolates that contain nuts to the number of chocolates that do not contain nuts.

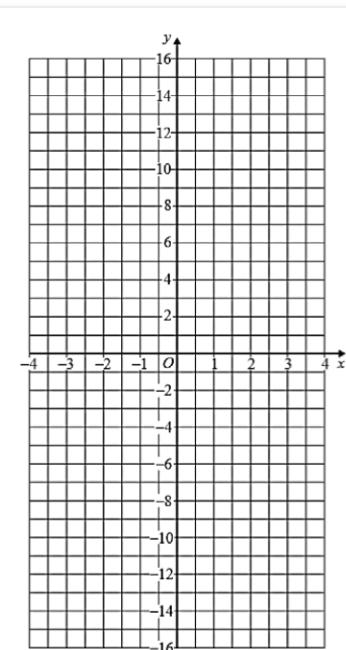
Give your answer in the form $1 : n$

22 A cycle race across America is 3069.25 miles in length.

Juan knows his average speed for his previous races is 15.12 miles per hour.
For the next race across America he will cycle for 8 hours per day.

(a) Estimate how many days Juan will take to complete the race.

25 On the grid below, draw the graph of $y = 1 - 4x$ for values of x from -3 to 3



GCSE (9-1) Maths for Science Questions (H1)

14 y is inversely proportional to d^2

When $d = 10$, $y = 4$

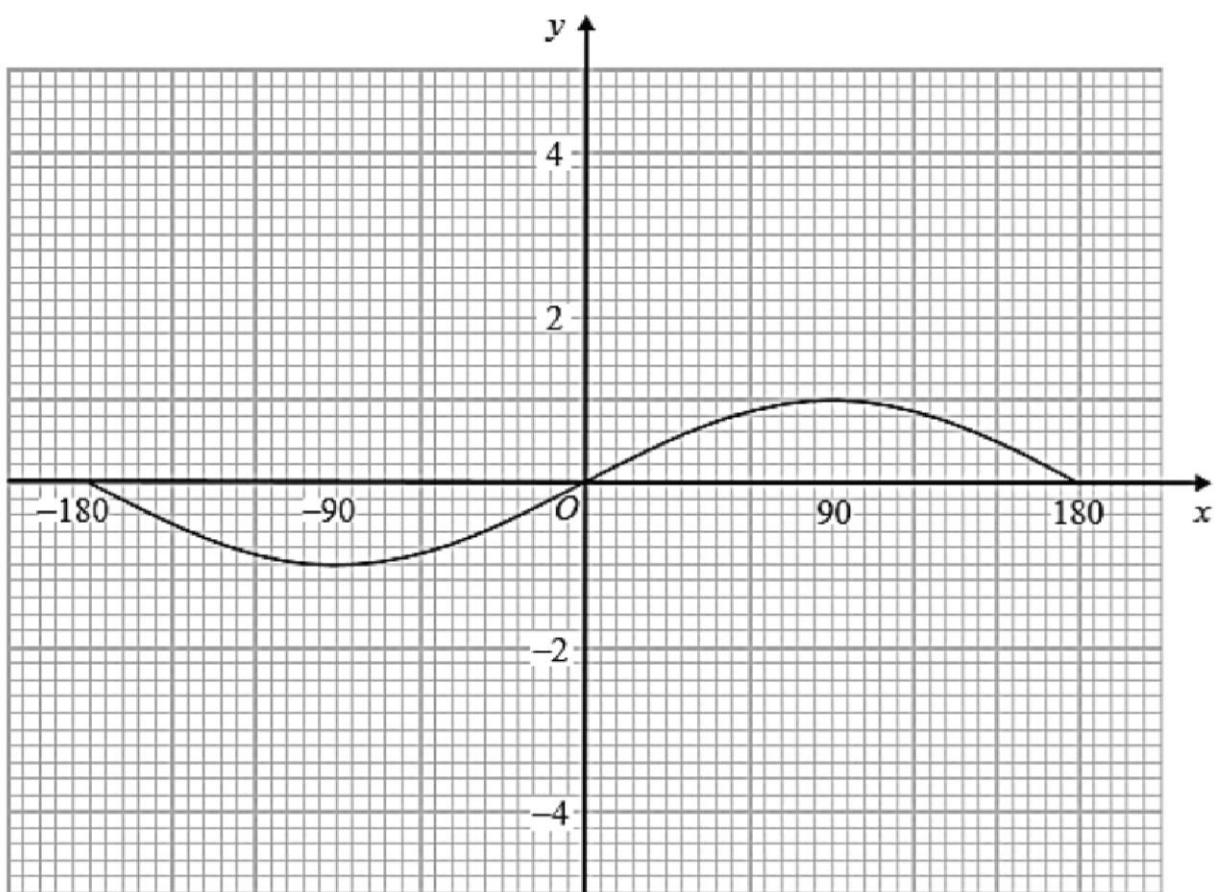
d is directly proportional to x^2

When $x = 2$, $d = 24$

Find a formula for y in terms of x .

Give your answer in its simplest form.

18 Here is the graph of $y = \sin x^\circ$ for $-180 \leq x \leq 180$



On the grid, sketch the graph of $y = \sin x^\circ - 2$ for $-180 \leq x \leq 180$

GCSE (9-1) Maths for Science Questions (F2)

9 Emily drives 186 miles in 3 hours.

(a) What is her average speed?

..... mph
(2)

Sarah drives at an average speed of 58 mph for 4 hours.

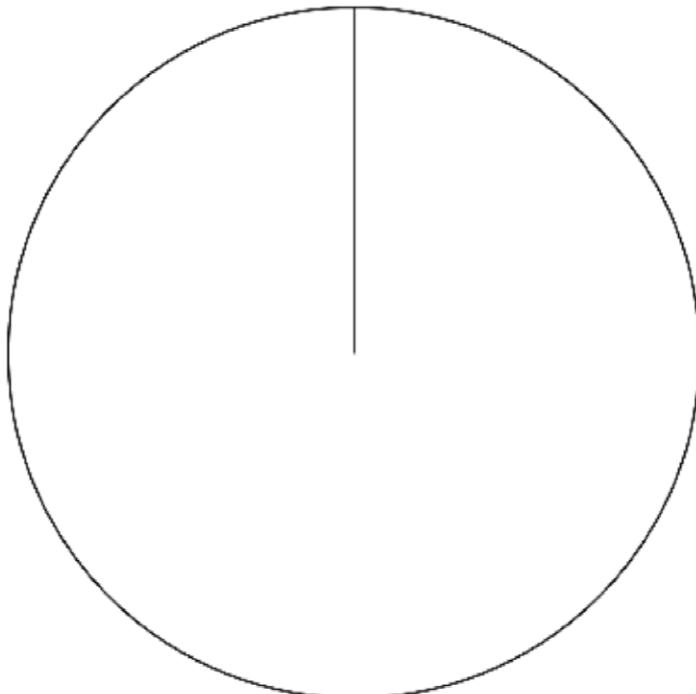
(b) How many miles does Sarah drive?

12 A group of football fans were asked what their half time snack was.

The table below gives information about their answers.

Snack	Number of fans
burger	11
pie	17
hot dog	8

Draw an accurate pie chart for this information.



17 Here is the list of ingredients for making 30 biscuits.

Ingredients for 30 biscuits

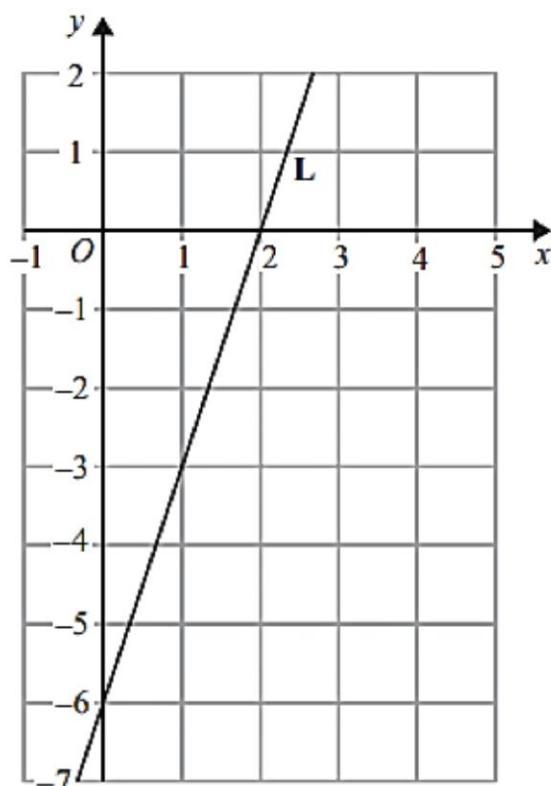
225 g butter
110 g caster sugar
275 g plain flour
75 g chocolate chips

Lucas has the following ingredients.

900 g butter
1000 g caster sugar
1000 g plain flour
225 g chocolate chips

What is the greatest number of biscuits Lucas can make?
You must show your working.

22 The line L is shown on the grid.



Find an equation for L.

25 A force of 70 newtons acts on an area of 20 cm^2

The force is increased by 10 newtons.

The area is increased by 10 cm^2

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

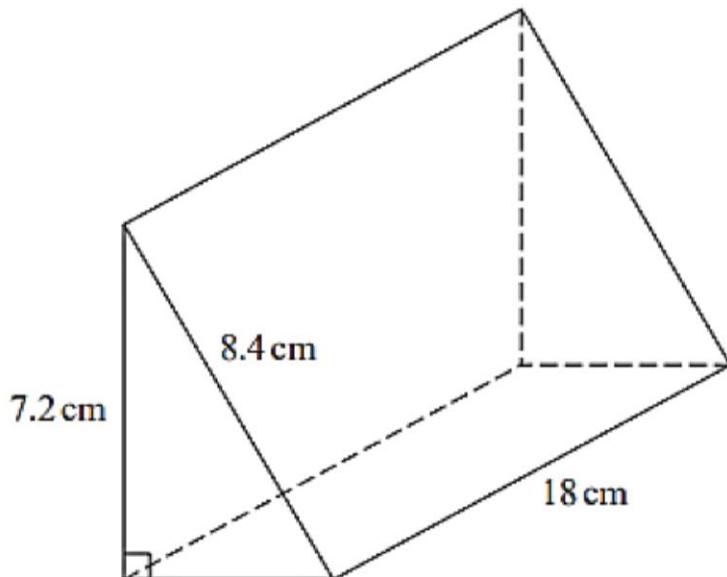
Helen says,

“The pressure decreases by less than 20%”

Is Helen correct?

You must show how you get your answer.

26 Here is a triangular prism.

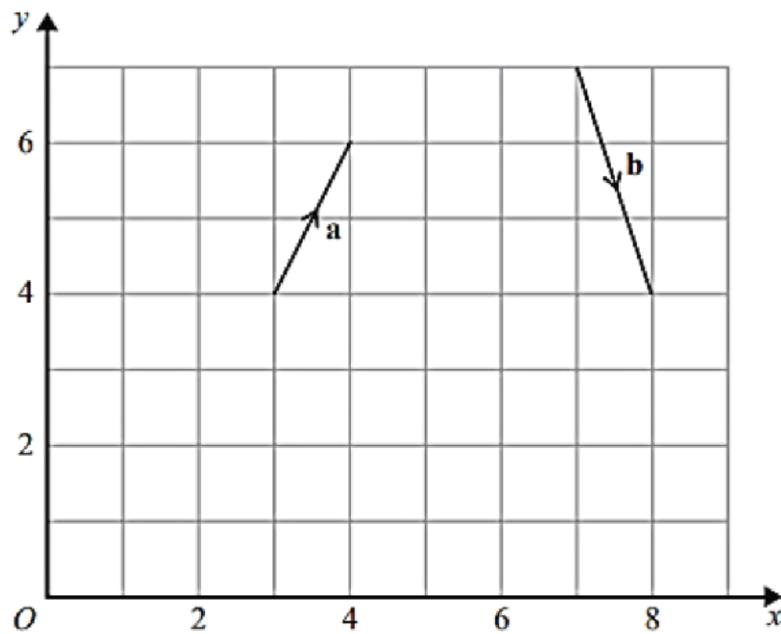


Work out the volume of the prism.

Give your answer correct to 3 significant figures.

GCSE (9-1) Maths for Science Questions (H2)

10 The vector \mathbf{a} and the vector \mathbf{b} are shown on the grid.



(a) On the grid, draw and label vector $-2\mathbf{a}$

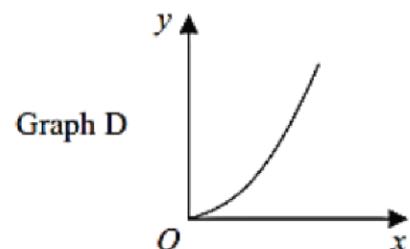
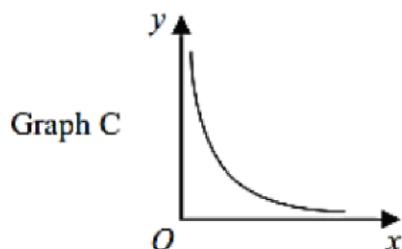
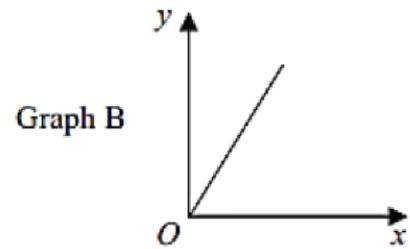
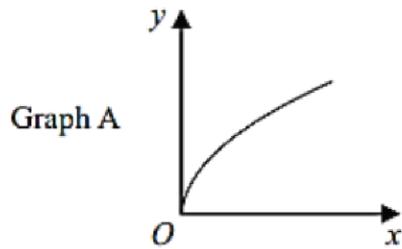
(1)

(b) Work out $\mathbf{a} + 2\mathbf{b}$ as a column vector.

$$\begin{pmatrix} \dots \\ \dots \\ \dots \end{pmatrix}$$

(2)

12



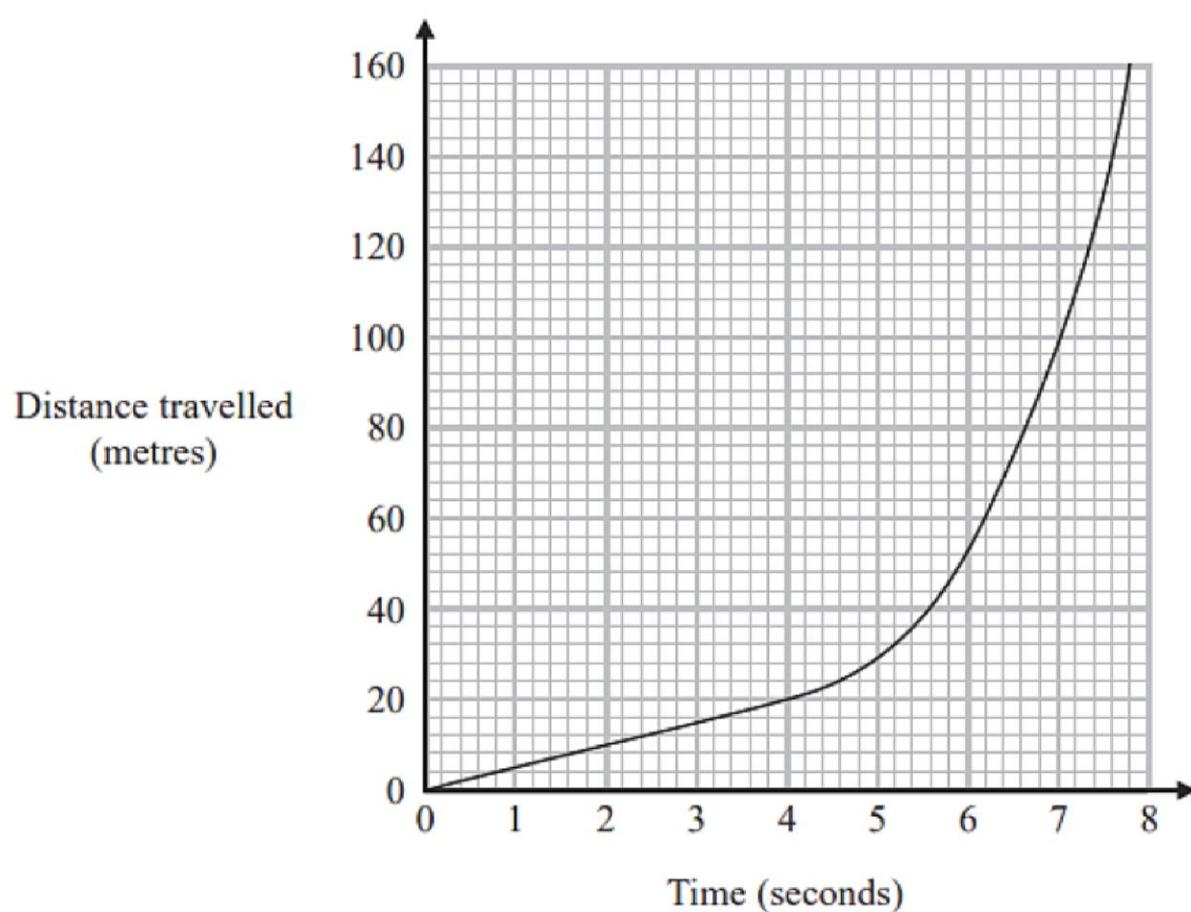
The graphs of y against x represent four different types of proportionality.

Match each type of proportionality in the table to the correct graph.

Type of proportionality	Graph letter
$y \propto x$	
$y \propto x^2$	
$y \propto \sqrt{x}$	
$y \propto \frac{1}{x}$	

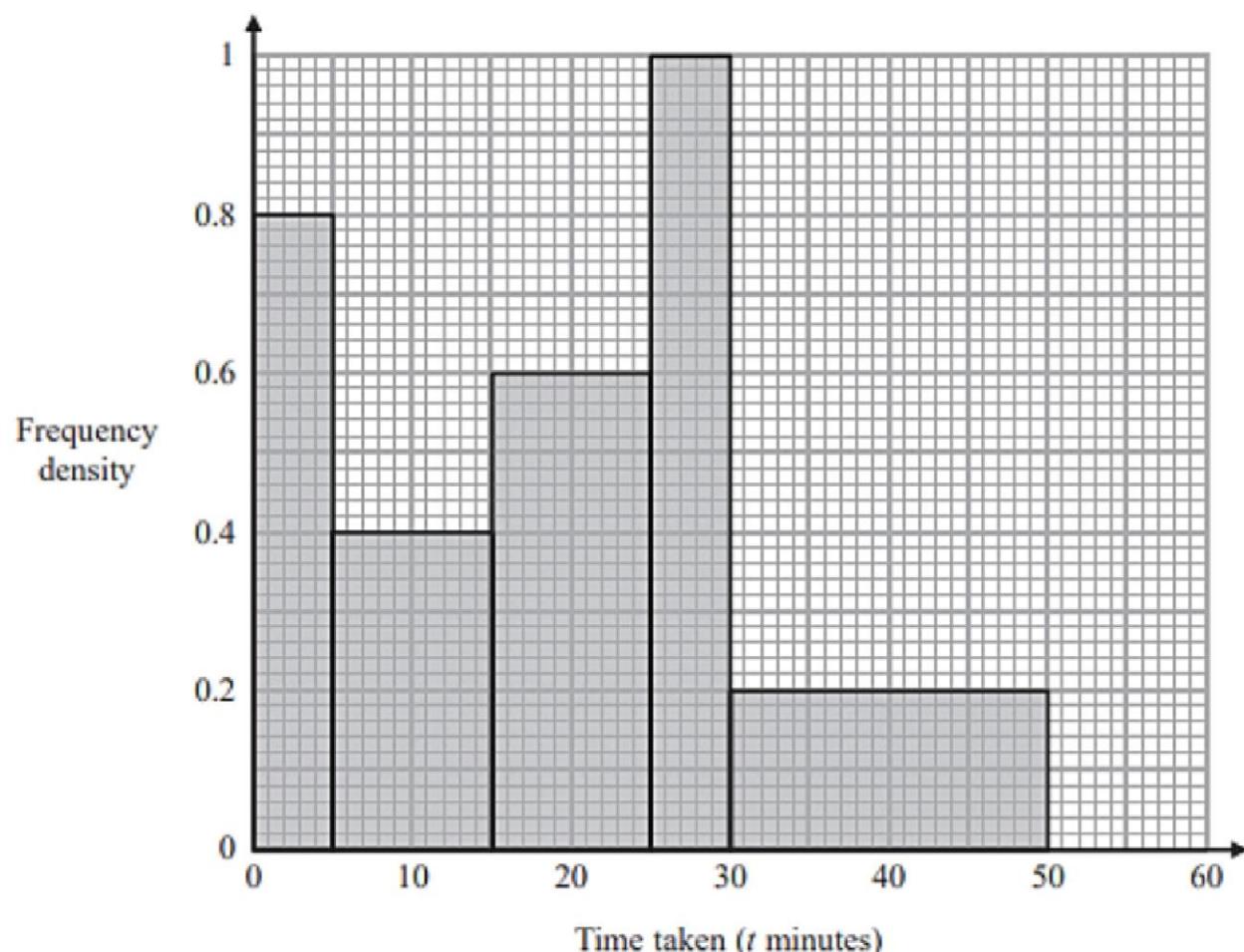
(Total for Question 12 is 2 marks)

14 The distance-time graph shows information about part of a car journey.



Use the graph to estimate the speed of the car at time 5 seconds.

- 17 The histogram shows information about the times taken by some students to finish a puzzle.



- (a) Complete the frequency table for this information.

Time taken (t minutes)	Frequency
$0 < t \leq 5$	4
$5 < t \leq 15$	
$15 < t \leq 25$	
$25 < t \leq 30$	
$30 < t \leq 50$	

- 21** Jackson is trying to find the density, in g/cm^3 , of a block of wood.
The block of wood is in the shape of a cuboid.

He measures

the length as 13.2 cm, correct to the nearest mm
the width as 16.0 cm, correct to the nearest mm
the height as 21.7 cm, correct to the nearest mm

He measures the mass as 1970 g, correct to the nearest 5 g.

By considering bounds, work out the density of the wood.
Give your answer to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

GCSE (9-1) Maths for Science Questions (F3)

- 9 This is part of a bus timetable between Bury and Manchester.

Bury	0825	0855	0915	0930	0945	1005
Whitefield	0834	0904	0924	0939	0954	1014
Heaton Park	0846	0916	0936	0951	1006	1027
Cheetham	0856	0926	0946	1001	1016	1037
Manchester	0905	0935	0955	1010	1025	1048

- (a) How many minutes should the 0825 bus take to go from Bury to Manchester?

..... minutes
(1)

Daniel goes from Whitefield to Manchester by bus.

Daniel takes 17 minutes to get from his house to the bus stop in Whitefield.
He takes 15 minutes to get from the bus stop in Manchester to work.

Daniel has to get to work by 10am.
He leaves his house at 8.45 am.

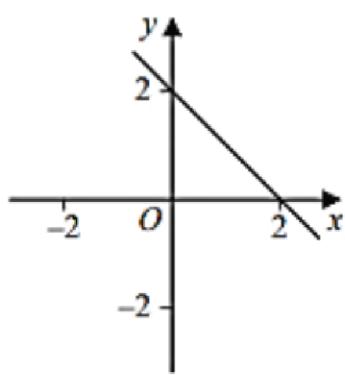
- (b) Does Daniel get to work by 10am?
You must show all your working.

- 18 Work out the value of

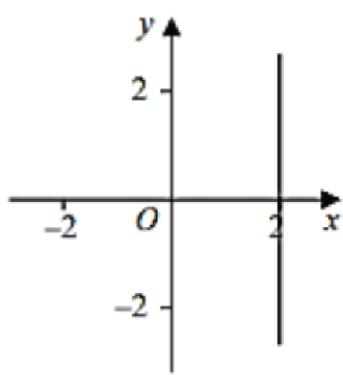
$$\frac{2.645 \times 10^9}{1.15 \times 10^3}$$

Give your answer in standard form.

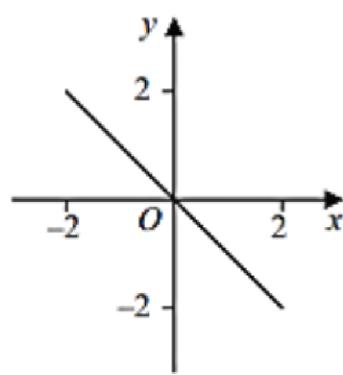
13 Here are six straight line graphs.



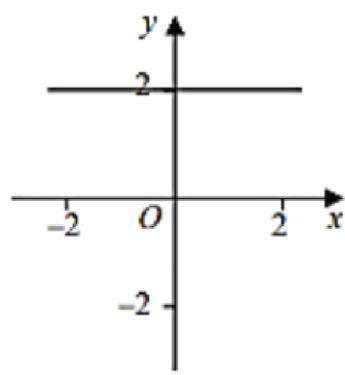
Graph A



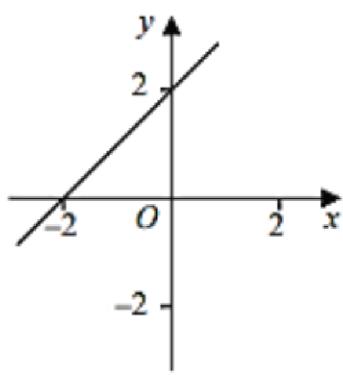
Graph B



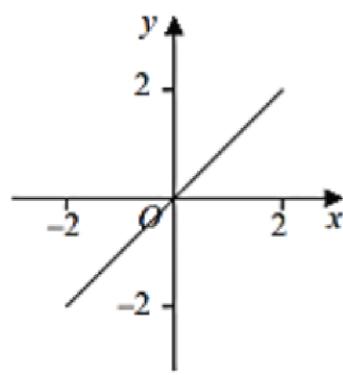
Graph C



Graph D



Graph E



Graph F

Match each equation in the table to the correct graph.
Write the letter of the graph in the table.

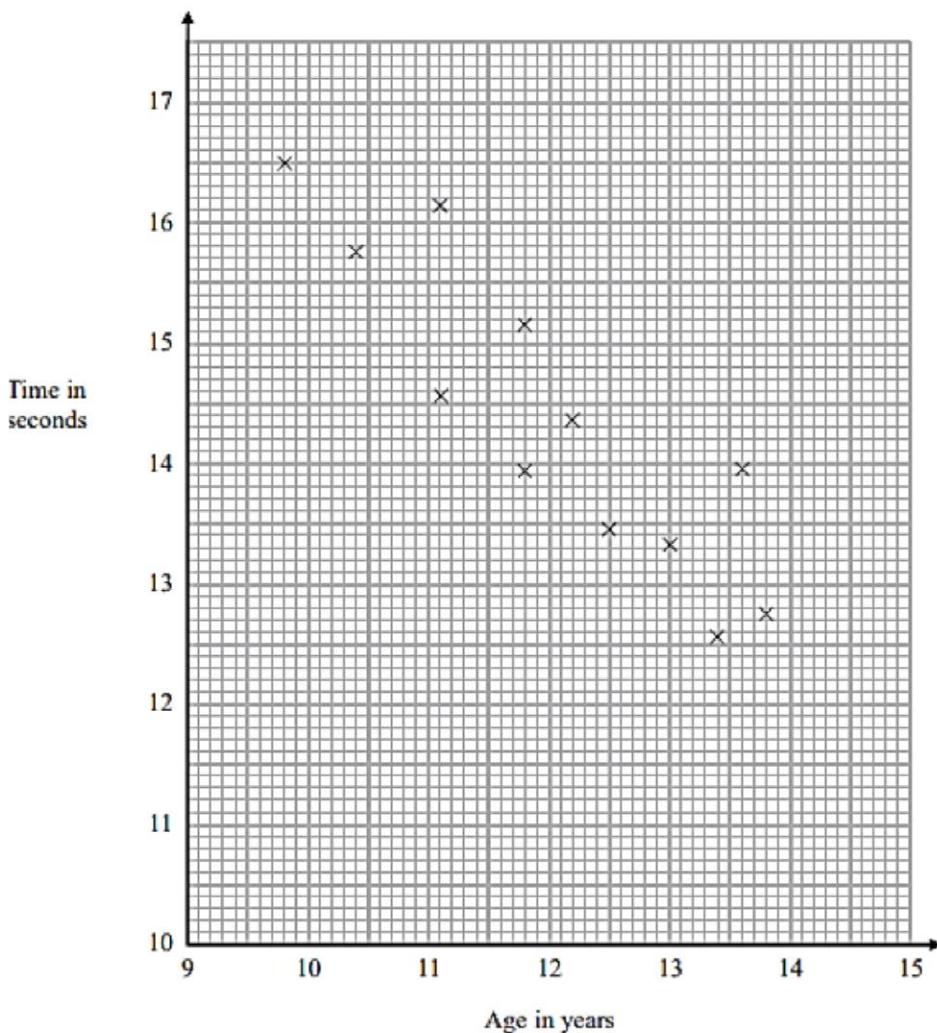
Equation	Graph
$y = 2$	
$y = x$	
$x + y = 2$	

28 Make g the subject of the formula

$$T = \sqrt{\frac{g+6}{2}}$$

19 The scatter diagram shows information about 12 girls.

It shows the age of each girl and the best time she takes to run 100 metres.



- (a) Write down the type of correlation.

Kristina is 11 years old.
Her best time to run 100 metres is 12 seconds.

The point representing this information would be an outlier on the scatter diagram.

- (b) Explain why.

(1)

Debbie is 15 years old.

Debbie says,

"The scatter diagram shows I should take less than 12 seconds to run 100 metres."

- (c) Comment on what Debbie says.

(1)

GCSE (9-1) Maths for Science Questions (H3)

9 $T = \sqrt{\frac{w}{d^3}}$

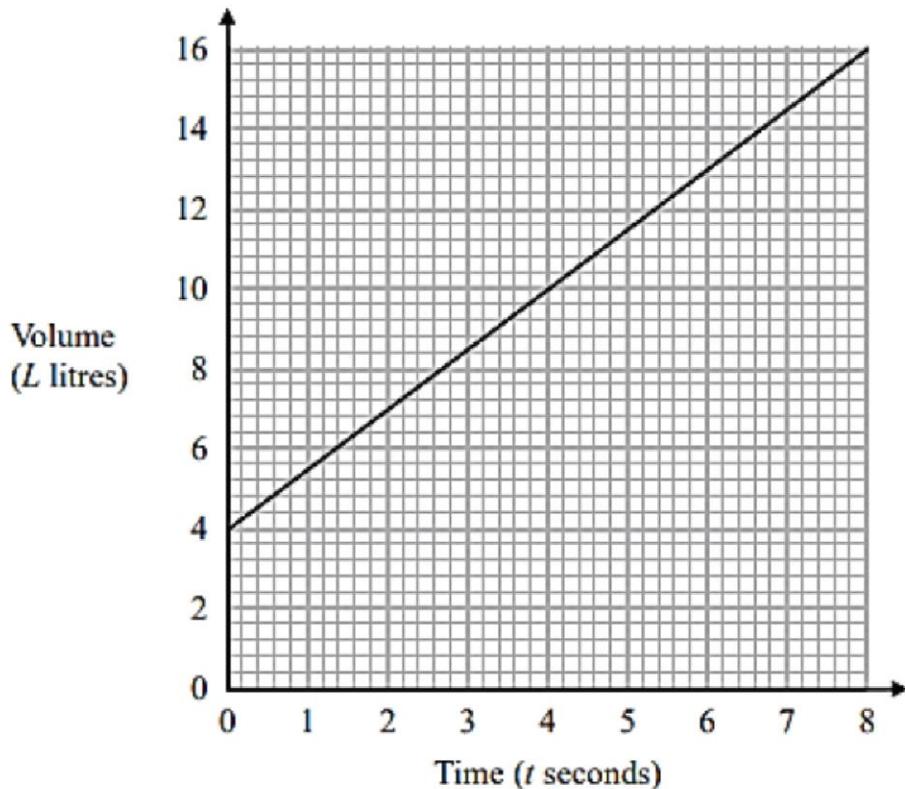
$$w = 5.6 \times 10^{-5}$$

$$d = 1.4 \times 10^{-4}$$

(a) Work out the value of T .

Give your answer in standard form correct to 3 significant figures.

12 The graph shows the volume of liquid (L litres) in a container at time t seconds.



(a) Find the gradient of the graph.

(b) Explain what this gradient represents.

13 Here are two similar solid shapes.

A



B



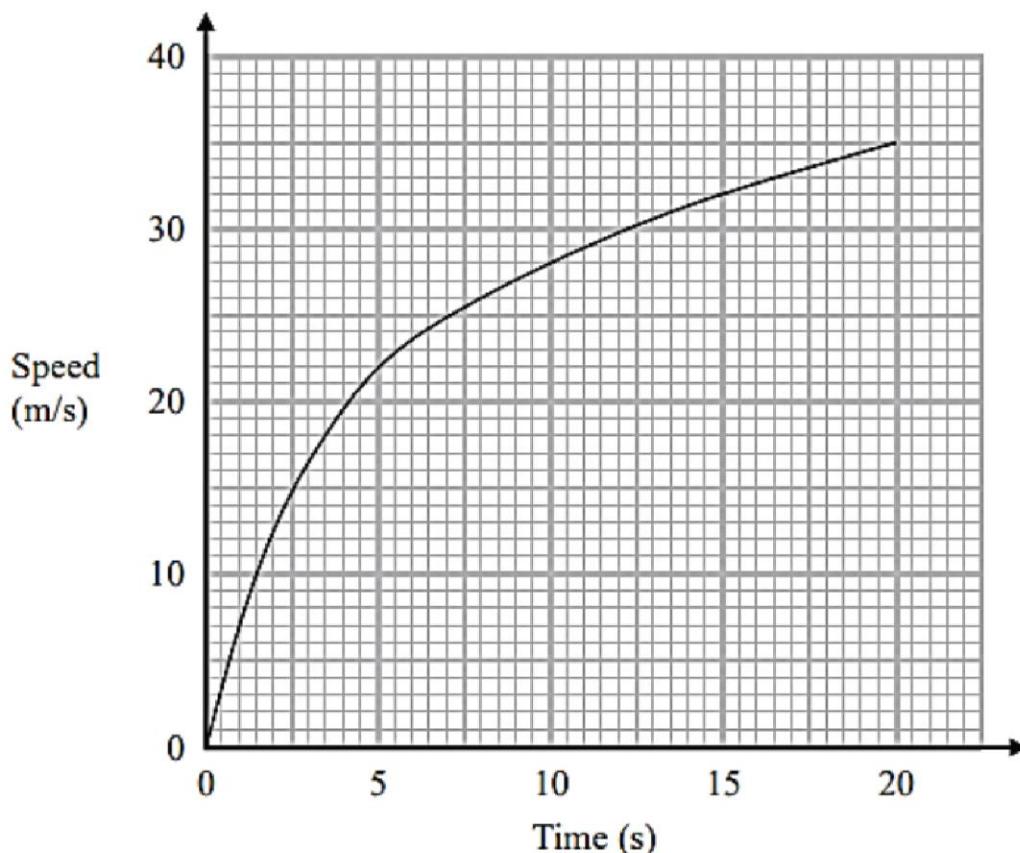
surface area of shape A : surface area of shape B = 3 : 4

The volume of shape B is 10cm^3

Work out the volume of shape A.

Give your answer correct to 3 significant figures.

- 15 The graph shows the speed of a car, in metres per second, during the first 20 seconds of a journey.



(a) Work out an estimate for the distance the car travelled in the first 20 seconds.
Use 4 strips of equal width.

(b) Is your answer to part (a) an underestimate or an overestimate of the actual distance the car travelled in the first 20 seconds?
Give a reason for your answer.

Notes

Paper/Tier	Higher-UK %	Foundation-UK %
Paper 1	14 - 43%	12 - 58%
	18 - 55%	16 - 56%
		17 - 45%
		22 - 41%
		25 - 16%
Paper 2	10 - 40%	9 - 86%
	12 - 71%	12 - 61%
	14 - 21%	17 - 61%
	17 - 51%	22 - 7%
	21 - 28%	25 - 32%
		26 - 10%
Paper 3	9 - 37%	9 - 75%
	12 - 56%	13 - 50%
	13 - 20%	18 - 52%
	15 - 47%	19 - 21%
		28 - 4%